SEAMAP and INTERMAR
Bottom Mapping Projects
and
SCDNR Historical Data Study
on Beach Nourishment Projects

by

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Project Time Frame

- Initiated in 1985 with a limited annual budget
- Coastal shelf effort completed in 2000

Project Goals

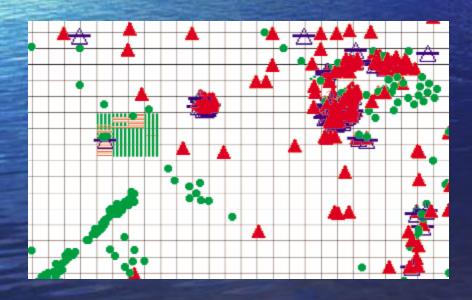
- Search existing coastal ocean databases for records that could be used to classify bottom type
 - (NC FL) beach to 200m
- Use standardized protocols for each type of data
- Involve state/federal experts on different data types
- Define bottom type (hard bottom, possible hard bottom, sand bottom, artificial reef, art. reef/hard bottom)

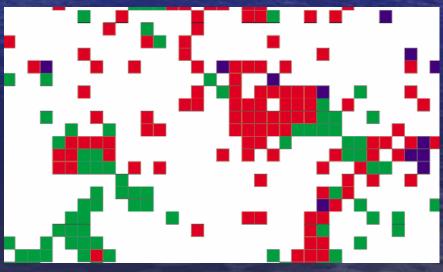
Data Types

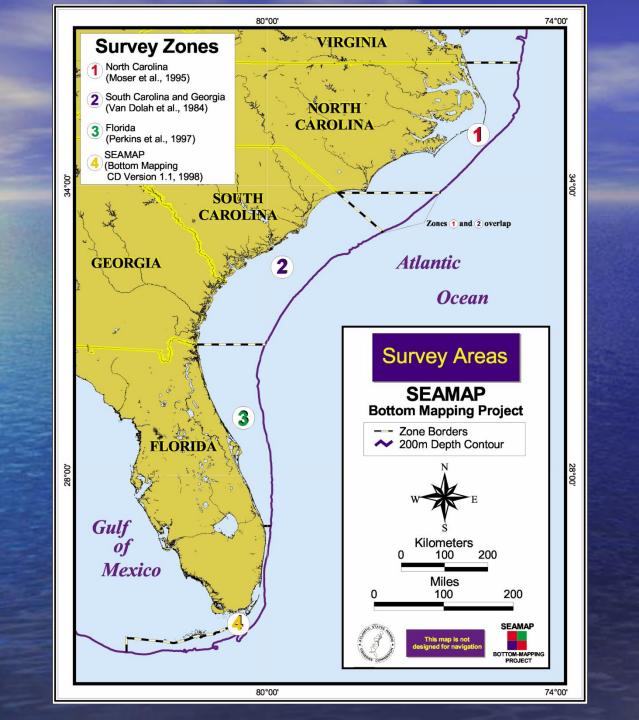
- Scientific diver observations
- Television and still camera records
- Trawl data (based on reef obligate species)
- Trap data (based on reef obligate species)
- Dredge data (based on sessile reef species)
- Side scan data (based on expert analyses)
- Point data and continuous line data

Database Structure

- Block grid system (1 min. latitude, 1 min. longitude)
- Continuous records separated by block boundaries

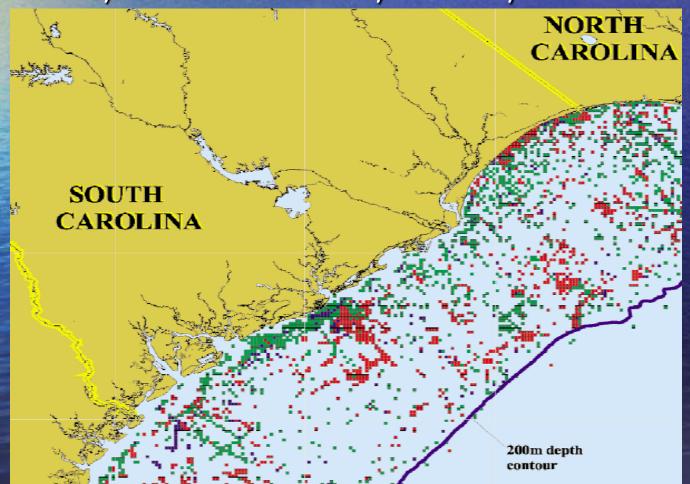






Results

Over 65,700 records for SA, Over 11,500 records off SC



Benefits of Program

- Most comprehensive for any region in the country
- Developed at relatively low cost (data mining only)
- Standardized procedures ability to select or deselect sources
- Evaluate quality of assessment by number of records
- GIS format for ease of evaluation (ArcView, ArcExplorer)

Deficits of Program

- Static data some now 30 years old
- Effort not continuing shifted to slope habitats in recent yrs.
- Some concerns about how data is presented on web

MMS — INTERMAR SC Task Force on Offshore Resources

Project Time Frame

- Initiated in 1992 with a limited annual budget
- SC shelf effort largely completed in 2001

Project Goals

- Expand SEAMAP database to include sand, mineral information
- Collect additional data in nearshore coastal zone related to hard bottom and potential sand sources
- Conduct several special studies
 - Shoreline migration rates and sediment budgets for Seabrook, Kiawah, Folly Is. -Katuna
 - Evaluation of beach renourishment performance in SC –King and Katuna
 - Evaluation of physical recovery rates in sand borrow sites off SC
 - Complete spatial analysis of bottom habitats

MMS-INTERMAR Task Force on Offshore Resources

Data Types

- Same as SEAMAP for hard bottom, sand bottom, etc.
- Data on sediment type and quality
 - Percent sand, silt, clay in the sediments
 - Percent carbonate in the sediments
 - Mean grain size
 - Percent total heavy minerals in sample
 - Percent phosphate in sample
- Data on sediment depth (seismic, vibracore data)
 - Minimum and maximum depth of penetration at data point
 - Minimum and maximum depth of sand lens at data point
- Point data (continuous line data evaluated at points)

MMS-INTERMAR Task Force on Offshore Resources

Database Structure

- Block grid system (1 min. latitude, 1 min. longitude)
- Continuous records evaluated at specific positional points

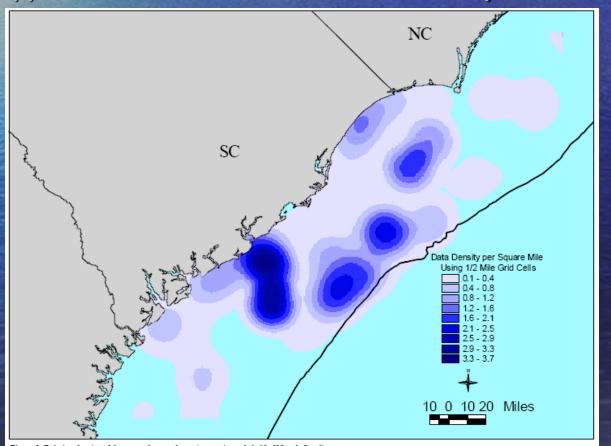
Database Sources

- SC studies by Corps, Coastal Carolina Univ., Contractors
- Other historical data available from multiple sources
- New data collected by Coastal Carolina Univ.

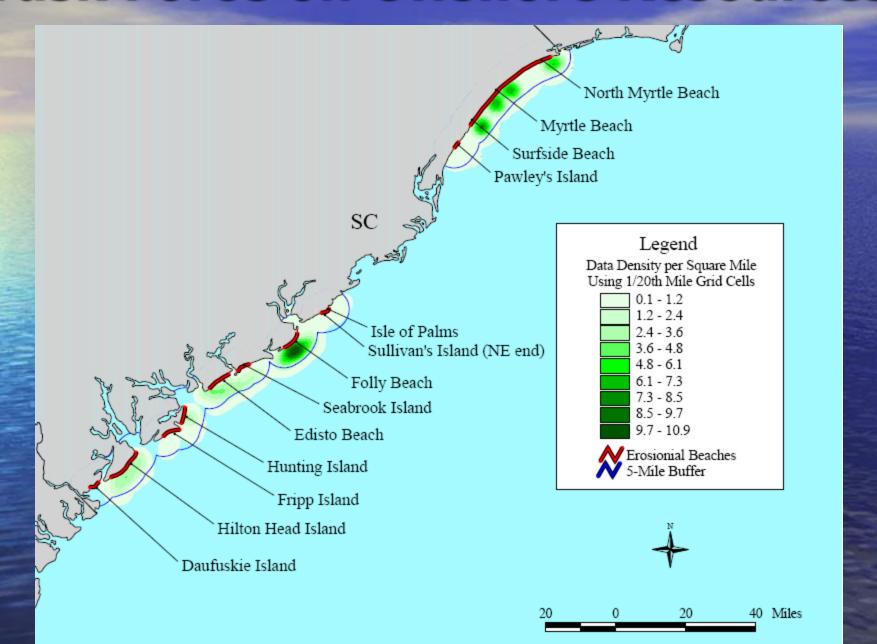
MMS-INTERMAR Task Force on Offshore Resources

Results

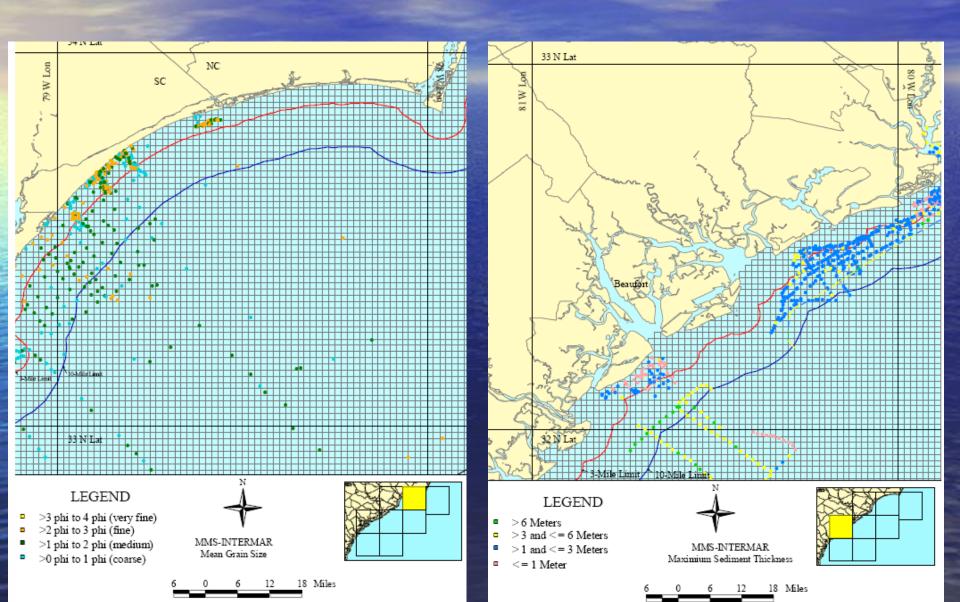
- Over 14,500 records for South Carolina
 - (approx. 3000 more records than SEAMAP)



Task Force on Offshore Resources



Task Force on Offshore Resources



Task Force on Offshore Resources

Benefits of Program

- Best available data at completion on sand resources for SC
- Developed at relatively low cost data mining, piggy back with other projects
- GIS format for ease of evaluation (ArcView, ArcIMS)

Deficits of Program

- Static data most sediment resource data timely during project but becoming dated
- Effort not continuing USGS mosaics being developed instead
- USGS mapping effort limited below Grand Strand area



Beach Nourishment Historical Database and Meta-Analysis

Major Goals:

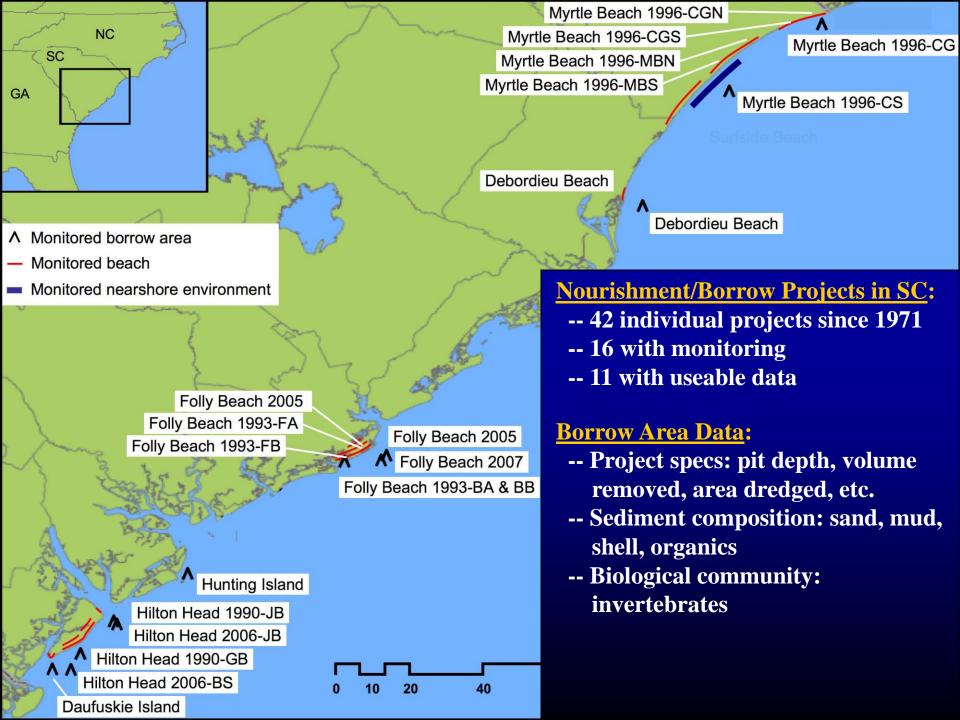
- 1) Centralize reports and data
- 2) Identify consistent physical and biological impacts
- 3) Develop empirically-defensible permitting conditions
- 4) Improve and standardize monitoring protocols

Regional sediment management ALSO depends on how human use interacts with sediment sources.

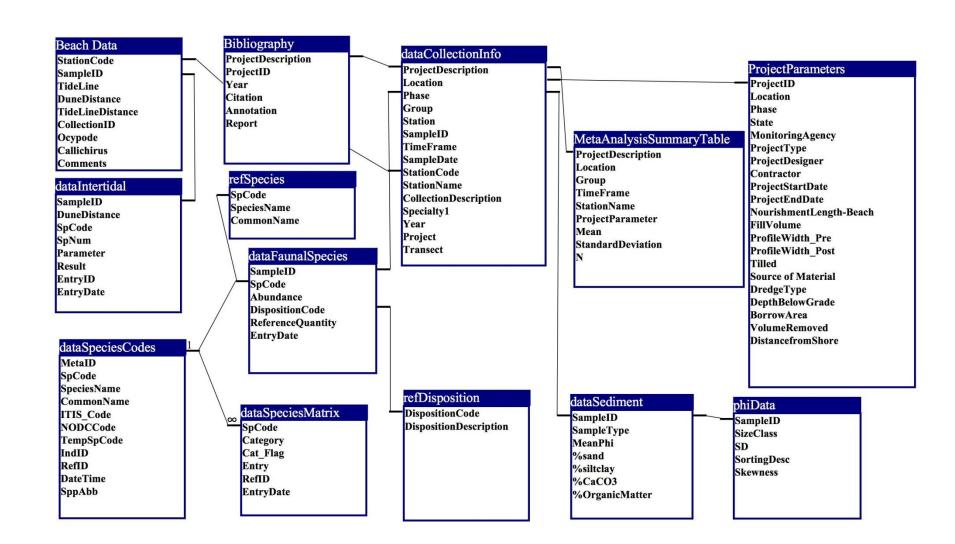


Sustainable re-use is dependent on minimizing impacts to efficient and economically feasible sediment sources.





Database Structure



Meta-Analysis Approach

Philosophy:

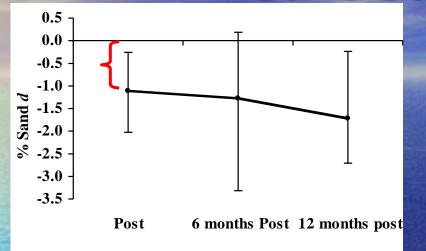
Treat each assessment/study as a single observation/experiment

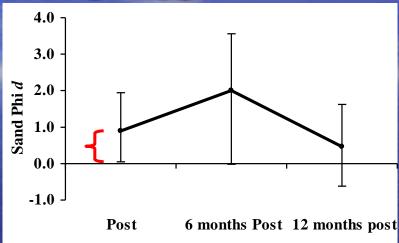
For Each Study:

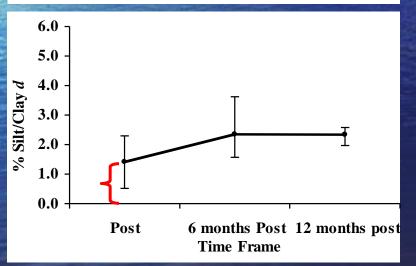
- 1. Calculate pre vs post change at impact site and at reference site
- 2. Calculate effect size (Hedge's d)

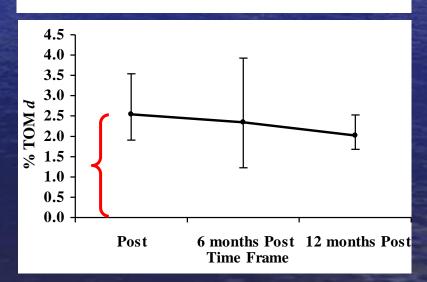
 Roughly, difference in change between impact and reference
 - 0 =no difference
 - + = elevated at impact
 - = depressed at impact

Example Analysis: Borrow Area Sediments



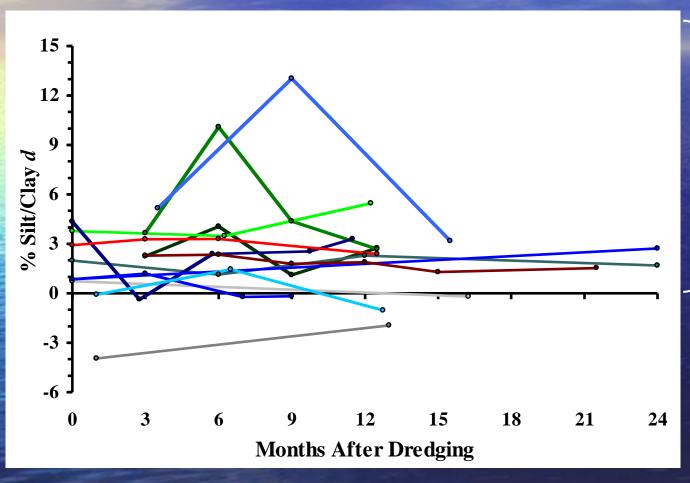






Overall trend of modified sediment characteristics up to one year post-nourishment

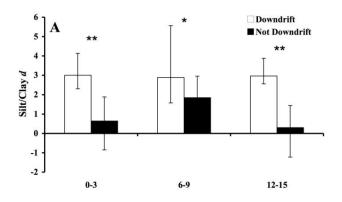
Example Analysis: Borrow Area Sediments

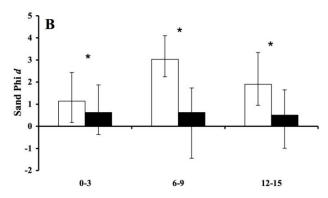


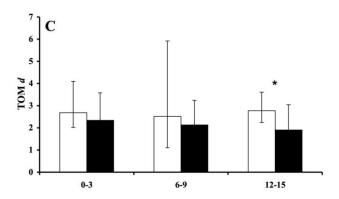
Elevated fines following dredging

Dredging changes critical sediment characteristics that affect reuse of area, but effect is site- and project-specific.

Borrow Area Placement







Integrity and sustainability of sediment source is dependent on borrow area placement.

Future

- Expand number of projects in database
- Integrate studies from other SE states (beyond?)
- Integrate other kinds of data and/or coordinate with other databases
- Improve and standardize monitoring protocols
- Address management-related issues more directly
 - Identify appropriate relationships between sand sources and dredging practices (placement, depth, area, timing, etc.)

